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A short term preschool readiness program was designed in 1967 to employ nonpedagogically trained middle class mothers as teachers for preschool disadvantaged children. The children chosen for this study were 43 Mexican-Americans and five Negroes from lower class families. Three classrooms, consisting of 12 children and three mothers each, were established. The remaining 12 children became part of a novel "home acculturation" group in which the children, in groups of four, went to the mother-teacher's home for the whole 6-week summer program. All children were administered intelligence tests during the first and sixth weeks of the program. A control group was tested and the results compared to the experimental group, but it was not possible to say that the two groups had similar entering abilities, and the test scores' analysis was inconclusive. The scores from the two experimental programs showed an increase from pretesting to posttesting but no significant differences between programs. An overall gain in achievement motivation was found for all children, although there was a significantly greater gain for those initially low in motivation on the pretests. No significant differences were found between the experimental and control groups. (WD)

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PART A

MIDDLE CLASS MOTHER-TEACHERS IN AN EXPERIMENTAL PRESCHOOL PROGRAM FOR SOCIALLY DISADVANTAGED CHILDREN*

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There are at least two major recognizable approaches to the structuring of preschool programs for the disadvantaged child in contemporary times. One strategy, perhaps most closely identified with the work of Bereiter and Engelmann at The University of Illinois, stresses highly structured programmatic intervention into the cognitive development of the disadvantaged preschooler. The more conventional nursery school strategy stresses children's opportunities for exploration, environmental enrichment, and the development of general coping adequacy through the impact of a program which is not especially aimed at stimulating cognitive growth. Preschool programs of both types, however, generally use teachers with some degree of educational (pedagogical) training and tend to have explicitly "educational" objectives.

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During the summer of 1967, the Child Development Evaluation and Research Center at The University of Texas at Austin, attempted a new experimental approach to enhancing short-term preschool readiness. The unique feature of the program was that it employed non-pedagogically trained middle class mothers as "teachers" in the ratio of 1 mother to 4 preschool disadvantaged children. The aim of the program was to enhance the school readiness of the children as measured by relatively conventional tests of intellectual ability, preschool achievement, achievement motivation, and accuracy of self-perception. The program itself was designed to be one which would intensify the affectional interactions between "mother-teacher" and the preschool child. It was expected that intensification of these relationships would operate to enhance school readiness, creative thinking abilities, achievement motivation, and accuracy of self-perception.

Assumptions and Program Features

Inadequate school readiness among disadvantaged children was viewed in this study as rooted in the child's having motivational and value systems different from those of the dominant culture which he encounters, as well as in cognitive differences, the importance of which is widely recognized. With the premise of conflicting value systems between the homes of the disadvantaged and the school,

this experiment's chief concern in treatment was recognition of a "reversal of demands process" experienced by the disadvantaged child. For the latter, movement from home to school implies expectations that are foreign to him, precipitated by the absence of an appropriate values foundation at home, in contrast with the experience of the child in the dominant culture. In the rearing of the socially disadvantaged child, minimum emphasis appears to be placed in the early years upon motivation to achieve. This is coupled with a paucity of life experiences, most notably a lack of affective parent-child relationships.

The experimental mother-teacher program attempted in this study <u>de-emphasized</u> an "academically-oriented" Head Start curriculum by providing continuing opportunities for close interaction between the mother-teacher and child, in effect creating something approaching a middle class home atmosphere in the classroom. Through such intimate relationships, it was believed, the disadvantaged child would have an opportunity for socialization experiences such as are presumably offered by "dominant-culture oriented" mothers. With this foundation, it was expected that the child would have a better basis than children in a "regular" Head Start program upon which to become assimilated into the school, i.e., in a more "natural" sequence of development.

Sample

The "experimental Head Start" group initially selected for this study consisted of 48 children from the Kenwood area of San Antonio, Texas. These children were predominantly of Mexican-American ethnicity. They were selected for the experimental preschool program according to the eligibility criteria of OEO with the help of San Antonio's CAA. The number of Mexican-American children involved was 43; there were 5 Negroes. The socioeconomic status of the group would most probably be classified as lower-lower class. The Kenwood area was chosen for the experimental preschool group upon recommendation of the CAA--the Economic Opportunity Development Corporation of San Antonio. The latter organization was particularly concerned about this area because of its acute poverty and the lack of Head Start classes for the majority of children during 1966-67.

The classes for the experimental preschool group were conducted for half-day sessions of four hours each on 5 days per week in a parochial school. Three classroom groups were established, each consisting of 12 randomly assigned children with 3 "mother-teachers". An added feature of the design was the establishment of 3 "Home Acculturation" groups for 12 of the children, 4 children being assigned randomly to each of three mother-teachers for the entire six-week period. These children did not participate in any of the

classroom programs, but instead were taken to the homes of the "mother-teachers" each day for family interaction experiences.

In the intial group meeting of the mother-teachers with a professional social worker, some of them requested the opportunity to use their homes in order to fulfill, more effectively, the requirements of the experimental program for disadvantaged children. It was felt that such use of the home environments was a quite "natural" way of utilizing the mother-teachers, and that it would afford opportunities for interactions which were not possible in any classroom. Although the "home sample" was small in number, the idea, generated by the mother-teachers, seemed a novel venture in the treatment of the socially disadvantaged child. It provided a social and educational "Foster-Day Care" plan, that permitted closer relationships of the children with the families of the mother-teachers. This aspect of the program provided an opportunity for the study of the value of such intervention in the education of culturally deprived children.

Classroom Composition

Thirteen middle class mothers were recruited to serve as "teachers" in the program. The group consisted of 10 Anglos, 1 Mexican-American, and 2 Negroes. The mother-teachers initially recruited volunteered their services with a request for reimbursement

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only for lunch and incidentals involved in the Home Acculturation Program. However, the time involved in the program made it difficult to recruit the total number of needed mother-teachers. It was decided, therefore, to reimburse all of the mother-teachers for their services to the program. Only one home acculturation mother-teacher withdrew her services (because of illness); otherwise the group of mother-teachers selected remained constant for the six-week experimental period.

The children were assigned to the classrooms and the "home acculturation" groups by random procedures, except for minor changes which were made to accommodate the special problems of participating children. The length of the program was set at six weeks. Continuation of the experimental preschool program for a longer period would have required several changes in the mother-teacher-child relationships due to necessary regrouping of children.

The children in the classrooms were <u>not</u> individually assigned a specific mother-teacher, since flexibility was desired in the forming of relationships. The mother-teachers were instructed to form small "family-type" groups among the 12 children in a room and to act as socializing agents for the children. They were to serve as models who displayed behaviors similar to those they used in the rearing of their own families. Educational and play equipment was provided to foster experience with objects, frequent verbal communication

with the mother-teacher, and peer instruction. Individual conferences and group meetings were held by a social worker with mother-teachers concerning their objectives and to aid them in solving instructional problems.

Instrumentation Used for Evaluation

The following tests were administered for the purpose of obtaining relevant data for evaluation of the experimental program: (1) the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and (2) Caldwell's Preschool Inventory. These tests were given to all experimental and comparison children during the first and sixth weeks of the programs. In addition, the Torrance Tests of Creative Thinking (non-verbal, 1966) were also administered, as were tests of achievement motivation and accuracy of self-perception described elsewhere in this Report.

Efforts to Establish a Control Group

The aforementioned tests were administered not only to children in the experimental program but also to a comparison group of Head Start children attending the summer 1967 St. James Head Start Program, San Antonio, Texas. However, tabulation of the test scores of these children indicated a significant difference in level of functioning as compared to the experimental group. The socioeconomic status of this initial comparison group was higher

than, and the ratio of Mexican-American children was not equal to, the Experimental Group. Therefore, the St. James Control Group was deleted as a Comparison Group from this study.

On September 6, 1967 the previously mentioned tests were administered to 20 children attending a Title I Preschool Class in the Sojourner Truth Elementary School (Kenwood area). An additional 24 children were selected from the DeZavala Elementary School Preschool Program in San Antonio, Texas. These children were as similar to the experimental children as it was possible to obtain, and the children had not had Day Care experience. Pre-testing of this Comparison Group was done during the first week of the program, and post-testing was completed during the sixth week of the program, as it had been, also, with our summer preschool experimental Ss. Comparisons of the Experimental and Control (comparison) Groups' family and home background characteristics are shown in Table 1. In general, the data in Table 1 do not lend confidence to the idea that the Experimental and Control (comparison) Groups were highly similar.

Table 1

Selected Family and Home Background Features of
Experimental Preschool and Comparison Group Subjects
(From OEO Form CAP-HS 46--Parent Interview)

Feature	Group: Experimental (N = 38)	Group: Comparison (N = 31)
1. Father figure absent from home	10.5%	19%
2. Modal age category of father figures	21-54 yrs.	21-54 yrs.
3. Mother figure absent from home	5%	6%
4. Modal age category of mother figure	21-54 yrs.	21-54 yrs.
5. Mean N of children per family	6	4
6. Relative living in the home	16%	22%
7. Non-relative living in the home	3%	--
8. Father figure having more than 8th grade education	30%	30%
9. Father figure unemployed	8%	3.6%
10. Mean N of rooms/person in homes	.50	.70
11. Homes with running water	100%	100%
12. Children (Ss) with previous Head Start, Day Care etc.	35%	8%
13. Siblings of Ss with preschool experience	8%	32%

Table 1 (continued)

Feature	Group Experimental (N = 38)	Comparison (N = 31)
14. Families receiving public welfare funds	9%	6%
15. Family possession of:		
a. car or truck	89%	65%
b. radio	34%	97%
c. television	74%	100%
d. telephone	24%	55%
e. newspaper	37%	65%

Results

Initial Control-Experimental Group Comparability

It should be noted that the Kenwood area of San Antonio, where our experimental preschool program was conducted, is one of the "hard-core" poverty pockets, which has remained relatively isolated from the rest of the community. Neighborhood Youth Corps employees actually went into the area's homes in order to recruit children for our experimental preschool program. Well may it be, therefore, that individuals, such as those from Kenwood, represent a lower socioeconomic level than that ordinarily reached by poverty programs. These individuals may not volunteer themselves automatically for particular poverty programs such as Head Start. Because of the adverse conditions of the community, the acquisition of a comparable Control Group was virtually impossible.

The group which was finally used as a Comparison Group was significantly different from the Experimental Group on pre-test scores of the Wechsler Preschool and Primary Scale of Intelligence (see Table 2). Therefore, pre- and post-test comparisons could not easily be justified. Comparisons could be made between the rates of change (groups x trials interaction) of each group, but, again, the inference could not be made that one program was superior to another, because the assumption could not be made that two distinct groups would change at similar rates under similar or different

Table 2

Comparisons (Analyses of Variance) of
Wechsler (WPPSI) Intelligence Pre-test Scores
for Experimental and Comparison Groups

Scale	Experimental Group IQ Mean (N = 42)	Comparison Group IQ Mean (N = 34)	F-Ratio	P
Verbal	69.10	81.09	16.22	.0003*
Performance	74.21	85.18	18.45	.0002*
Full Scale	68;84	81.26	21.51	.0001*

*Statistically significant

programs. The original point of intellectual functioning may be a factor influencing rate of change. Nevertheless, results obtained from both the Comparison and Experimental Groups will be reported.

Pre-test Results

Analyses of variance of pre-test scores from the five scales of the Preschool Inventory revealed that no significant differences occurred between the Experimental and Comparison Group children. Performances of the two groups were quite similar on the Personal-Social Scale, the Associative Vocabulary Scale, the Concept Activation-Numerical Scale, the Concept Activation-Sensory Scale, and the Total Scale Score. Table 3 does, however, show a non-significant tendency for the Experimental Group to exceed the Comparison Group on Preschool Inventory performance on all scales excepting the Associative Vocabulary Scale. These results are unique when the data obtained with other instruments are considered. In summary, however, there were no significant differences between the performances of Comparison and Experimental Group children on the Preschool Inventory.

Table 3

Comparisons (Analyses of Variance) of
Preschool Inventory Pre-test Scores
for Experimental and Comparison Groups

Scale	Experimental Group Mean (N = 42)	Comparison Group Mean (N = 34)	F-Ratio	P
I. Personal-Social Scale	14.49	13.94	.27	.6133
II. Associative Vocabulary Scale	7.54	8.18	.20	.6624
III. Concept Activation-Numerical	8.92	7.88	1.87	.1718
IV. Concept Activation-Sensory	11.79	10.65	1.48	.2260
V. Total Score	42.85	40.68	.45	.5130

Significant differences between the two groups were apparent on the Torrance Tests of Creative Thinking (Table 4). The Experimental Group scored significantly higher than the Comparison Group on all four Torrance Scales. The differences on Fluency, Originality and Elaboration were extremely great and, although somewhat lower, the differences on the Flexibility Scale were also statistically significant. The Experimental Group was significantly higher in "creativity" at the beginning of the Head Start Program when creativity was measured by the Torrance Tests of Creative Thinking.

The Wechsler Preschool and Primary Scale of Intelligence (WPPSI) was administered to both the Comparison and Experimental Groups at the beginning of the program. Again the results (Table 2) indicated that the Comparison and Experimental Groups were initially significantly different in intellectual functioning as measured by the WPPSI. The Comparison Group scored significantly higher than the Experimental Group on the Verbal, Performance, and Full Scales. These differences were significant at well beyond the .01 level.

The pre-test results provided three findings: (1) The Comparison and Experimental Groups were comparable in their performance on the Preschool Inventory. (2) The Experimental Group scored significantly higher than the Comparison Group on the Torrance Tests of Creative Thinking. (3) The Comparison Group had a significantly higher level of intellectual functioning as measured by the WPPSI. These results emphasize a basic problem in current research, which is that of acquiring an adequate Comparison or Control Group.

Table 4

Comparisons (Analyses of Variance) of
Torrance Creativity Pre-test Scores
for Experimental and Comparison Groups

Scale	Experimental Group Mean (N = 40)	Comparison Group Mean (N = 34)	F-Ratio	P
I. Fluency	12.22	5.06	13.43	.0008*
II. Flexibility	6.08	4.18	4.16	.0424*
III. Originality	10.78	4.35	9.53	.0032*
IV. Elaboration	17.97	7.85	13.07	.0009*

*Statistically significant

Pre- and Post-Test Comparison

Pre- and post-test comparisons were made by analysis of variance procedures for the Comparison and Experiment Groups. The general design was a groups by trials one. Dependent variables were measured by the Preschool Inventory, the Torrance Tests of Creative Thinking, the WPPSI, and certain tests of achievement motivation. Results for the accuracy of self-perception measure will be reported in Part B of this Report.

Tables 5-9 indicate that no significant changes took place on any of the five scores of the Preschool Inventory. These findings are of some interest in view of the fact that some of the teachers of the Comparison Group reported having taught some items directly from the Preschool Inventory. Even under these conditions, no significant score improvements or losses were found to be present in the final analysis for either group.

Pre- and post-test results for the Torrance Tests of Creative Thinking are presented in Tables 10-13. The Comparison Group and Experimental Group were significantly different on all four scales of the Torrance tests. There were no significant pre-post changes on the Fluency Scale, and there were no significant differences between the rates of change (groups x trials interaction) for the two groups (Table 10). The great difference between the scores of the Comparison and Experimental Groups cannot be explained, but the Experimental Group was markedly higher on the Fluency Scale.

Table 5

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Preschool Inventory Scale I: Personal-Social Scale

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	14.49	13.94	14.23
Post-test	14.69	14.59	14.64
G-Means	14.59	14.26	

	F-Ratio	P
Between Groups	.087	.7662
Within Trials	.454	.5099
Groups x Trials	.130	.7197

Table 6

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Preschool Inventory Scale II: Associative Vocabulary

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	7.54	8.18	7.8356
Post-test	8.05	8.15	8.0959
G-Means	7.79	8.16	

	F-Ratio	P
Between Groups	.115	.7349
Within Trials	.257	.6199
Groups x Trials	.277	.6064

Table 7

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Preschool Inventory Scale III: Concept Activation-Numerical

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	8.92	7.88	8.44
Post-test	9.08	8.79	8.95
G-Means	9.00	8.34	

	F-Ratio	P
Between Groups	.912	.6552
Within Trials	1.850	.1748
Groups x Trials	1.029	.3148

Table 8

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Preschool Inventory Scale IV: Concept Activation-Sensory

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	11.79	10.65	11.26
Post-test	11.92	11.62	11.78
G-Means	11.86	11.13	

	F-Ratio	P
Between Groups	.633	.5654
Within Trials	1.631	.2031
Groups x Trials	1.063	.3068

Table 9

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Preschool Inventory Scale V: Total Score

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	42.85	40.68	41.84
Post-test	43.79	43.38	43.60
G-Means	43.32	42.03	

	F-Ratio	P
Between Groups	.143	.7080
Within Trials	1.402	.2385
Groups x Trials	.345	.5658

Table 10

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Torrance Scale I: Fluency

Ns	37	34	
Groups	Experimental	Comparison	T-Means
Pre-test	12.22	5.06	8.79
Post-test	14.18	4.23	9.42
G-Means	13.20	4.65	

	F-Ratio	P
Between Groups	43.622	.0000
Within Trials	.309	.5869
Groups x Trials	1.501	.2225

Table 11 shows that on the Flexibility Scale of the Torrance Tests of Creative Thinking, the rate of change (groups x trials interaction) of the Comparison and Experimental Groups approached significance. This may be accounted for by the fact that the Experimental Group apparently gained slightly and the Comparison Group seemingly lost slightly. The Experimental Group was again significantly higher on the Flexibility Scale. This difference, however, was not of the magnitude observed for the previous scale, Fluency.

Group differences of great magnitude were again apparent in Table 12. On the Originality Scale, the Experimental Group had significantly higher scores than the Comparison Group. The Experimental Group gained during the program, while the Comparison Group lost slightly, but neither finding was statistically significant.

The results of the Elaboration Scale of the Torrance tests are presented in Table 13. A significant difference was found between groups, trials, and rates of change (groups by trials interaction). It appears that these differences can be accounted for by the exceptionally high pre-test score of the Experimental Group. On post-test results the Experimental Group mean dropped to one similar to that of the Comparison Group.

Table 11

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Torrance Scale II: Flexibility

Ns	37	34	
Groups	Experimental	Comparison	T-Means
Pre-test	6.08	4.18	5.17
Post-test	7.73	3.47	5.69
G-Means	6.91	3.82	

	F-Ratio	P
Between Groups	12.672	.0010
Within Trials	.620	.5604
Groups x Trials	3.159	.0763

Table 12

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Torrance Scale III: Originality

Ns	37	34	
Groups	Experimental	Comparison	T-Means
Pre-test	10.70	4.35	7.70
Post-test	13.30	3.50	8.61
G-Means	12.04	3.93	

	F-Ratio	P
Between Groups	19.216	.0001
Within Trials	.258	.6195
Groups x Trials	.896	.6508

Table 13

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Torrance Scale IV: Elaboration

Ns	37	34	
Groups	Experimental	Comparison	T-Means
Pre-test	17.97	7.85	13.13
Post-test	7.16	7.00	7.08
G-Means	12.57	7.43	

	F-Ratio	P
Between Groups	6.017	.0159
Within Trials	19.917	.0001
Groups x Trials	13.500	.0008

Results of pre- and post-testing on the Wechsler Preschool and Primary Scale of Intelligence are shown in Tables 14, 15 and 16. The Comparison Group had significantly higher scores on the Verbal Scale of the WPPSI. Pre-post changes were not significant, although the Experimental Group did gain in the desired direction while the Comparison Group lost slightly (Table 14).

On the Performance Scale of the WPPSI the Comparison Group's mean was again significantly higher. Both groups gained significantly during the preschool programs, and the rate of change (groups x trials interaction) showed a nearly significant difference in favor of the Experimental Group.

Mean Full Scale IQ scores are presented in Table 16. The Comparison Group had significantly higher scores on the Full Scale of the WPPSI. Pre-post gains were significant, and the Experimental Group's amount of change was great enough to yield results approaching significance in the groups by trials interaction.

Table 14

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Wechsler Verbal IQ

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	69.10	81.09	74.68
Post-test	71.74	78.62	74.95
G-Means	70.42	79.85	

	F-Ratio	P
Between Groups	14.803	.0005
Within Trials	.028	.8629
Groups x Trials	2.649	.1041

Table 15

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Wechsler Performance IQ

Ns	39	34	
Groups	Experimental	Comparison	T-Means
Pre-test	74.21	85.18	79.32
Post-test	80.79	88.44	84.36
G-Means	77.50	86.81	

	F-Ratio	P
Between Groups	15.141	.0004
Within Trials	23.554	.0001
Groups x Trials	2.550	.1108

Table 16

Analysis of Variance Comparing Experimental and Comparison Groups, Pre and Post, on Wechsler Full Scale IQ

Ns	38	34	
Groups	Experimental	Comparison	T-Means
Pre-test	68.84	81.26	74.71
Post-test	73.66	81.74	77.47
G-Means	71.25	81.50	

	F-Ratio	P
Between Groups	19.189	.0001
Within Trials	5.050	.0261
Groups x Trials	3.111	.0785

Partial Summary and Conclusions

The findings indicate that no significant group differences occurred in performance on the Preschool Inventory, and there were no significant gains by either the Comparison or Experimental Group on the Preschool Inventory. On the Torrance Tests of Creative Thinking, the Experimental Group was superior to the Comparison Group at the beginning of the preschool programs. There is no explanation for the extremely high scores attained by the Experimental Group. The only significant pre-post changes occurred on Torrance's Elaboration Scale when the Experimental Group lost over 10 points on the average. The Comparison Group had significantly higher scores on the Verbal, Performance, and Full Scale of the WPPSI and in the desired direction. Pre-post changes were statistically significant on the Performance and Full Scales. On all three scales of the WPPSI the Experimental Group had numerically greater gains. It is apparent that during their participation in either program, the children in both the Experimental and Comparison Groups changed in the desired direction.

Comparison of Two Experimental Methods

Within the four experimental classes conducted in San Antonio, two distinct experimental treatments were used. Classes 1, 2 and 3 were held in separate classrooms of a parochial school building, while Class 4, as noted earlier in this paper, was conducted in an entirely different manner as a Home Acculturation Class. Eight to twelve children participated in this treatment; eight completed it. These children (in groups of 3 or 4) were taken into homes of middle class mothers for half-day sessions, daily, during the six-week period. The mothers attempted to treat the children as if they were family members. Analyses of variance were performed in order to compare the two preschool methods used in the study.

There were no significant differences between classes, between trials (pre and post), or rates of change (groups x trials interaction) for classes on Preschool Inventory performance (Tables 17-21). It should be noted that slight losses or gains were present on each of the five Preschool Inventory scales. Total score comparisons (Table 21) do show increases for both groups, with the Home Acculturation Class performing at a numerically slightly higher level on pre-test and gaining more on post-test.

Table 17

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Preschool Inventory Scale I: Personal-Social Scale

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	14.23	15.50	14.49
Post-test	14.87	14.00	14.69
G-Means	14.55	14.75	

	F-Ratio	P
Between Groups	.011	.9136
Within Trials	.060	.8037
Groups x Trials	1.062	.3102

Table 18

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Preschool Inventory Scale II: Associative Vocabulary

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	7.71	6.88	7.54
Post-test	7.84	8.88	8.05
G-Means	7.77	7.88	

	F-Ratio	P
Between Groups	.003	.9587
Within Trials	.414	.5310
Groups x Trials	.898	.6482

Table 19

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Preschool Inventory Scale III: Concept Activation-Numerical

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	8.90	9.00	8.92
Post-test	8.71	10.50	9.08
G-Means	8.81	9.75	

	F-Ratio	P
Between Groups	.566	.5368
Within Trials	.080	.7760
Groups x Trials	1.574	.2153

Table 20

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Preschool Inventory Scale IV: Concept Activation-Sensory

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	11.94	11.25	11.79
Post-test	11.65	13.00	11.92
G-Means	11.79	12.13	

	F-Ratio	P
Between Groups	.046	.8256
Within Trials	.047	.8236
Groups x Trials	1.952	.1675

Table 21

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Preschool Inventory Scale V: Total Score

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	42.84	42.88	42.85
Post-test	43.06	46.63	43.79
G-Means	42.9516	44.7500	

	F-Ratio	P
Between Groups	.085	.7698
Within Trials	.161	.6930
Groups x Trials	.362	.5579

Results obtained from the Torrance Tests of Creative Thinking are presented in Tables 22 through 25. Several large fluctuations were observed, most of which were not significant because of the small N. However, these differences may indicate that the use of the Torrance Tests of Creative Thinking with deprived children is a questionable procedure. On Fluency (Table 22) none of the results were statistically significant, but the Home Acculturation Class showed almost a 10-point gain on post-testing. On the Flexibility Scale (Table 23), both experimental groups showed improvements, with the Home Acculturation Class again showing the greater positive change. Group differences and trial differences pre and post) approached significance, and there was a nearly significant difference between the rates of change for the two groups; Class 4 (Home Acculturation) changed at a nearly significantly greater rate. Although the Home Acculturation Class had a large positive change on the Originality Scale (Table 24), none of the results were statistically significant.

Both groups obtained negative change scores on Elaboration (Table 25). The 2 groups were significantly different, and pre-post losses were also great enough to achieve significance. The rates of loss, however, were similar for each group. The Wechsler Preschool and Primary Scale of Intelligence (WPPSI) was administered to all children participating in the experimental program. Pre-post

Table 22

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Torrance Scale I: Fluency

Ns	29	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	14.24	4.88	12.22
Post-test	14.24	14.00	14.19
G-Means	14.24	9.44	

	F-Ratio	P
Between Groups	3.417	.0697
Within Trials	1.041	.3156
Groups x Trials	3.773	.0572

Table 23

Analysis of Variance Compariang Classroom and Home Acculturation Groups on Torrance Scale II: Flexibility

Ns	29	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	7.07	2.50	6.08
Post-test	7.72	7.75	7.73
G-Means	7.40	5.16	

	F-Ratio	P
Between Groups	1.906	.1730
Within Trials	2.547	.1158
Groups x Trials	3.352	.0723

Table 24

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Torrance Scale III: Originality

Ns	29	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	12.07	6.13	10.78
Post-test	13.31	13.25	13.30
G-Means	12.69	9.69	

	F-Ratio	P
Between Groups	.534	.5237
Within Trials	.559	.5338
Groups x Trials	.519	.5171

Table 25

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Torrance Scale IV: Elaboration

Ns	29	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	20.00	10.63	17.97
Post-test	7.93	4.38	7.16
G-Means	13.97	7.50	

	F-Ratio	P
Between Groups	4.267	.0438
Within Trials	22.026	.0001
Groups x Trials	1.081	.3062

analysis results are given in Tables 26, 27 and 28. Both groups showed numerical gains on the Verbal Scale of the WPPSI. Class 4 (Home Acculturation) showed a greater gain than did the Classroom Group, although the results were not statistically significant (Table 26). Results obtained from the Performance Scale are presented in Table 27. Change scores obtained from pre- and post-tests were statistically significant and indicated that all of the children changed in a positive direction. Group differences and rate of change differences were not significant. Both groups showed gains from the pre- to post-testing on the WPPSI Full Scale Scores (Table 28). Full Scale Scores support the view that children participating in our experimental preschool Head Start Programs changed in a positive and desirable direction in intellectual functioning.

Partial Summary and Conclusions

Overall, in intellectual functioning as measured by the WPPSI, and according to the results of the present study, disadvantaged children participating in our experimental Head Start Programs changed in a positive direction. The results of this study indicated that these changes took place in two different types of programs; variations were not usually significant. Changes in other areas as measured by the Preschool Inventory were only minimal, while scores from creativity measures produced contradictory results.

Table 26

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Wechsler Verbal IQs

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	69.52	67.50	69.10
Post-test	71.90	71.13	71.74
G-Means	70.71	69.31	

	F-Ratio	P
Between Groups	.091	.7617
Within Trials	1.285	.2634
Groups x Trials	.046	.8257

Table 27

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Wechsler Performance IQs

Ns	31	8	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	74.77	72.00	74.21
Post-test	81.65	77.50	80.79
G-Means	78.21	74.75	

	F-Ratio	P
Between Groups	.708	.5897
Within Trials	23.195	.0001
Groups x Trials	.164	.6906

Table 28

Analysis of Variance Comparing Classroom and Home Acculturation Groups on Wechsler Full Scale IQs

Ns	31	7	
Groups	Classroom	Home Acculturation	T-Means
Pre-test	69.29	66.86	68.84
Post-test	74.19	71.29	73.66
G-Means	71.74	69.07	

	F-Ratio	P
Between Groups	.361	.5583
Within Trials	7.692	.0086
Groups x Trials	.011	.9127

Achievement Motivation

Achievement motivation has been studied in great detail in college-age populations. There has not been, however, a correspondingly great number of studies concerning the development of this important motive in other age groups. The reason for the lack of studies with young children is probably the scarcity of methods to measure, reliably, the Achievement Motive. The T.A.T.-type method is useless with children who (1) have difficulty verbalizing a story, (2) have limited vocabulary, and (3) who have not been exposed to story-telling in their homes.

Aronson (1958) developed a method for measuring "Need Achievement", which can be used with relative success with children from culturally deprived environments. This method, described in greater detail in Espinosa (1968), assesses Achievement Motivation through the analysis of expressive "doodles" and "scribbles" elicited by a complex abstract design. Content analysis of this expressive material, produced by High and Low n-Achievement subjects, permitted Aronson to derive a scoring method in which discrete, single unattached lines were associated with a tendency to approach success; fuzzy, overlaid lines were indicative of fear of failure. In this way, scoring each instance of discrete lines as positive (+1) and each occurrence of fuzzy lines as negative (-1), a total n-Achievement Score could be derived. A Low n-Achievement Score corresponds to a subject whose fear of failure is stronger than his tendency to achieve success, and, vice versa, for a high score.

The possiblity of classifying subjects into High and Low n-Achievement Groups, permits an independent test of the behavioral correlates of the strength of the Achievement Motive. Atkinson (1957) developed a model of risk-taking behavior to predict the choices of High and Low n-Achievement subjects when confronted with tasks that differ in their probabilities of success. Based on this model, Espinosa (1968) devised a Level of Aspiration Test, the Marble Game, to measure risk-taking behavior in children.

The Marble Game consists of five cardboard boxes, each with a hole of different width, aligned against a bare wall. The task consists of rolling a standard size marble through the holes from five feet away. The size of the holes, in combination with the distance from which subjects have to throw, permits the manipulation of the probability of success for each box. Two blocks of ten trials are given, the first block being the one in which the reward for a successful trial is a verbal reinforcement from the Experimenter. In the second block, the rewarded block, each successful trial is rewarded with candy, one piece for the easiest box, two for the next, and so on up to five pieces of candy for the most difficult box. Giving a score of 1 to the easiest box, 2 to the next, etc., and 5 to the most difficult one, regardless of the outcome, a Mean Box Score for each block can be obtained. The relative spread of the choices can be measured as the Standard Deviation of the Box Scores. The Atkinson (1957) model, using the variables of Motive, Probability

of Success, and Incentive Value of Success permits predictions regarding the likely levels of risk and spread of the choices for High and Low n-Achievement subjects.

McClelland (1953) proposed that the development of the Achievement Motive is related to the types, frequencies, and amounts of reinforcement. On the other hand, Hess and Shipman (1965) have suggested that the types of reinforcements that characterize the behavior of lower class families, being in general unrelated to the behavior that elicits them, could have effects that are very different from those present among white middle class families. In their words, "the meaning of deprivation is a deprivation of meaning."

With this information, we can expect that Head Start will have a very important impact on the development of the Achievement Motive. If the teachers and aides, and every adult in contact with the children, gives reinforcement for every achievement-related behavior every time it occurs, this should have an effect in promoting the development of the motive to achieve success and, eventually, should lead to the extinction of the fear of failure.

Hypotheses

I. There will be an overall increase in Achievement Motive between pre- and post-test as measured by the Aronson Test.

Assuming that a Low n-Achievement Score is indicative of a strong Motive to Avoid Failure, as Atkinson does, we would expect that the influence of the Head Start experience of reinforcements would change, primarily, the Motive to Avoid Failure. Thus

II. The Low n-Achievement Group (i.e., those high on the Motive to Avoid Failure) should show a greater increase in their n-Achievement Score at post-test than should the High n-Achievement Group.

Hypotheses I and II refer to the overall effect of Head Start on the Achievement Motive. Espinosa (1968) instructed, explicitly, half of the teachers in his sample to be extremely rewarding to any achievement-oriented behavior on the part of their pupils, but research failed to demonstrate a significant difference between the children whose teachers were so instructed and a Control Group (see Section II of this Report). Examination of the actual behavior of the teachers in the classroom revealed that there was no difference between the Experimental and Control teachers in their behavior. Since the teachers and adults in the present study were not explicitly instructed to be aware of achievement-related behavior and to reward it each and every time it occurred, any difference found between the

groups should be a by-product of the general manipulation that differentiates each class from another. Thus, in general, it can be expected that

III. The experimental classes will show a greater increase in the Achievement Motive from pre- to post-test than will the Control classes.

From Atkinson's risk-taking behavior model (1957), we have expected that

IV. High n-Achievement subjects will tend to choose intermediate risk levels, while Low n-Achievement subjects will tend to choose either very high or very low risk levels in the Marble Game.

V. High n-Achievement subjects will show less variability in their choices than will Low n-Achievement subjects in the Marble Game.

Results: Achievement Motivation

The Achievement Gain Score was computed for each subject by subtracting his n-Achievement Score, at pre-test, from his n-Achievement Score at post-test. The mean n-Achievement Gain Score was 2.18 (S.D. 2.57, S.D. (M) 0.462, $z = 4.71$, $p = .001$). Thus, Hypothesis I is confirmed since the overall n-Achievement Gain is significantly greater than zero. An analysis of variance of the Achievement Gain Score with T_1 (Experimental) and T_2 (Control) and A_1 (High n-Achievement at pre-test) and A_2 (Low n-Achievement at pre-test) is presented in Table 29. This analysis shows that there

Table 29

Analysis of Variance of Achievement Motivation Gain Scores

Source	S.S.	D.F.	M.S.	F	P
Total	205	31			
Between	124	3			
A (Achievement)	120	1	120	41.6	.001
T (Treatment)	2	1			
A x T	2	1			
Within	81	28	2.88		

Analysis of Variance: Cell Means

	Achievement	
	High (A_1)	Low (A_2)
T_1 (Experimental)	.25	2.31
T_2 (Control)	.25	1.81

N = 8 per cell

was no significant difference between the Experimental and Control classes, thus failing to prove Hypothesis III. Hypothesis II, however, was confirmed. The cell means showed a significantly greater gain for the initially Low n-Achievement subjects. The main effect was significant at better than the .001 level.

When the four Experimental classes and the four Control classes were taken as eight independent groups, the simple-analysis of variance presented in Table 30 revealed no significant "between groups" variance. With eight groups, there were seven degrees of freedom, and we could run seven different orthogonal comparisons. The two important comparisons are presented in Table 30. There is no significant difference when groups E_1, E_2, E_3, and E_4 are compared against C_1, C_2, C_3, and C_4. The comparison between groups E_1, E_2, and E_3 vs. E_4 (the Home Acculturation Group) shows a significant difference ($p = .05$). The only additional comparison that could be significant is C_1, C_2, and C_3 vs. C_4. This comparison was not run since its interpretation is impossible without additional information on the teachers. It could be that the teacher of Group C_4 was more careful in rewarding the children, thus explaining the difference. However, we lack that information.

For the analysis of the Marble Game data we made a distribution of the Mean Box for the four Experimental classes and another distribution for the four Control classes. The same procedure was followed for the Variability Score (Standard Deviation of the Box Scores).

Table 30

Orthogonal Comparisons of Classes

Source	S.S.	D.F.	M.S.	F	P
Total	205	31			
Between	45.50	7	6.50		
E_{1234} vs. C_{1234}	3.12	1			
E_{123} vs. E_4	27.00	1	27.00	4.09	.05
Within	159.50	24	6.60		

Group	E_1	E_2	E_3	E_4	C_1	C_2	C_3	C_4
Total	+5	+9	+7	+19	+6	+8	+3	+13
ϕ_1	-1	-1	-1	-1	+1	+1	+1	+1
ϕ_2	-1	-1	-1	+3	0	0	0	0

N = 4 per cell, $\Sigma\phi^2_1 = 8$; $\Sigma\phi^2_2 = 12$; $\Sigma\phi^2_1 \times \phi^2_2 = 0$

In order to test Hypothesis IV, we divided the distribution of Mean Box into four quartiles. For a High n-Achievement Group subject (a subject that scored above the median at pre-test) it was predicted that his Mean Box Score would fall in either Q_2 or Q_3 (in the middle range of the distribution) and for a Low n-Achievement subject it was predicted that his Mean Box Score would fall into either Q_1 or Q_4 (extremes of the distribution).

A similar procedure was followed to test Hypothesis V, although here the prediction for the High n-Achievement subject was that his Variability Score would fall below the median (low variability) while for a Low n-Achievement subject the prediction was that his Variability Score would fall above the median (high variability).

With this method, we counted E (Expected) when the behavior of the subject followed the predictions from the Atkinson model, and U (Unexpected) when his behavior on the test did not follow the predictions. The results for the combined predictions for Mean Box and Variability are presented for Experimental and Control classes in both pre- and post-test in Table 31.

The results show that the predictions from the model are significantly better than chance for the Experimental Group ($p = .05$) but <u>not</u> for the Control classes (p = n.s.). During post-test,

Table 31

Level of Aspiration Test Predictions

Variable	Group	N	E	U	X	D.F.	P
Pre-test							
Mean Box and Variability Combined							
	Exp.	16	12	4	4.00	1	.05
	Cont.	16	7	9	.25	1	n.s.
Post-test							
Mean Box and Variability Combined							
	Exp.	16	13	3	6.25	1	.01
	Cont.	16	12	4	4.00	1	.05

however, the predictions are better than chance for both Experimental ($p = .01$) and Control ($p = .05$) classes, reflecting the overall increase in n-Achievement Scores. Thus, Hypotheses IV and V are confirmed.

Conclusions

The analysis of the data for the Aronson Test and the Marble Game indicate that there was an overall gain in Achievement Motive between pre- and post-test. At the same time, there was a significantly greater gain for the initially Low n-Achievement subjects than for the initially High n-Achievement subjects. These results replicate Espinosa's (1968) results with a similar population. The failure to find significant differences between Experimental and Control classes is not surprising, since there was no explicit attempt to manipulate reinforcement for achievement-related behaviors. The significantly greater gain in n-Achievement experienced by Experimental Group 4 (Home Acculturation Group) than for Ss in the mother-teacher classes would indicate that something was present in that group that was lacking in the remaining three Experimental classes and in the four Control groups. We must be very careful in interpreting these results, however, in light of the very small number (4 per class). Overall, these data replicate other findings with a larger sample of a similar population.

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